H-6160

Solid-Liquid Extraction Demonstrator

Purpose

The Hampden **Model H-6160** Solid-To-Liquid Extraction Demonstrator permits student study of the fundamentals of a solid/liquid extraction system. The student is able to determine the operating characteristics of solvent extraction from a packed bed. The equipment is constructed out of stainless steel and glass for material compatibility. Furthermore, glass parts are used where observation of the process is informative. The corrosion resistant nature of the equipment allows the unit to be used with a wide variety of systems including: water/inorganic salts; water/sugar beets; methylene chloride/vegetable oil; water/coffee and others. All experiments use non-flammable solvents.

Description

The Hampden **Model H-6160** Solid-to-Liquid Extraction Demonstrator is equipped with all components required to operate the system. The solvent is stored in a solvent feed tank with an integral heater. Thus, the temperature of the solvent can be varied by manipulating the power to the solvent heater. The solvent is pumped at a constant rate into the extraction column by the solvent feed pump. A flowmeter is included in the solvent feed line. The extraction column is constructed out of glass to allow observation of the extraction process. The solid material is held in a removable retainer. Sampling ports are included at the inlet and outlet of the extraction column. The process is compatible with a distillation column which allows solvent recovery and/or concentration of the extract.

The distillation column includes an electrically-heated boiler with variable power control, a condenser, reflux assembly, and temperature and sampling points to monitor the system performance. All points requiring vents are tied together to allow one outlet for removal of solvent vapors. All temperatures that need to be monitored are indicated by a digital thermocouple display.

MODEL H-6160 Solid-Liquid Extraction Demonstrator
Dimensions: 80"H x 45"W x 20"D - Weight: 700 lbs.

All Hampden units are available for operation at any voltage or frequency

Hampden® ENGINEERING CORPORATION

021104

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Chemical Engineering Systems

Educational Training Equipment for the 21st Century

Bulletin 616A

Experiment Capabilities

- Perform mass balances on both the solvent stream and packed bed.
- Calculate the mass transfer rates.
- Determine the effect of solvent temperature on the extraction process.
- Determine the effects of particle size on the mass transfer rates.
- Determine the effects of flow on the extraction process
- Perform organic and aqueous extractions
- Conduct percolation leaching experiments

Technical Specifications

Extraction column:
- volume - 1 liter

Solvent feed pump range:
- 0 to 250 ml/min.

Solvent feed tank:
- 5 liters

Solvent heater:
- 0 to 500 watts

Distillation column:
- 100 mm length
- 50 mm diameter

Distillation column boiler:
- 5 liters

Distillation column boiler heater:
- 0 to 1000 watts

Services Required

- Cold water supply (tap)
- Electrical supply:
  120/220VAC-1ϕ-50/60Hz.
- Air ventilation system

Construction Specifications

- All components are mounted on a steel frame constructed out of square mechanical tubing
- All steel surfaces are finished with oven-baked enamel
- The control instrumentation is located on a control panel which is surface-mounted to the steel frame
- The control panel is finished in white, oven-baked enamel
- All control instruments are clearly identified by means of a silkscreened legend. The entire unit is completely factory-assembled and tested
- The unit is self-contained, requiring only the listed services
- The overall dimensions are:
  80"H x 45"W x 20"D

Computer Data Logging

This feature adds two dual thermocouples, one flow transmitter, and one pump input into the system. One interface package consisting of National Instruments I/O modules and LabVIEW® templates is provided for interfacing into an IBM compatible computer through the RS-232 port.

Specify **MODEL H-6160-CDL**

Option must be specified at time of original order.

Shop view of multiple **MODEL H-6150** Liquid-Liquid Extraction Demonstrators and **MODEL H-6160** Solid-Liquid Extraction Demonstrators

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